Before the
Federal Communications Commission
Washington, D.C. 20554

In the Matter of

Carrier Current Systems, including Broadband over Power Line Systems	)	
Amendment of Part 15 regarding new requirements and measurement guidelines for Access Broadband over Power Line Systems	)	ET Docket No. 04-37

COMMENTS OF CQ COMMUNICATIONS, INC.

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EXECUTIVE SUMMARY

CQ Communications Inc., a major publisher for the personal radio community, believes that Broadband over Power Lines (BPL) as described in the Notice of Proposed Rulemaking, is too great an interference source to be permitted to operate at the current frequencies of 2-80 MHz. Furthermore, we believe the NPRM overstates BPL's potential for bringing high-speed internet access to those currently without a broadband option, and understates the danger of harmful interference to licensed services.

In addition, we believe that certain critical technical issues, such as the impact of skywave propagation of BPL signals and of signal mixing at points of impedance discontinuity – resulting in new signals far removed from the original frequencies – have

not been sufficiently discussed or researched. The interference mitigation methods proposed, in our view, are inadequate, particularly when applied to radio users who listen and/or transmit on a variety of frequencies on a variety of frequency bands. And we strongly protest the suggestion that licensed users bear partial responsibility for mitigaging interference caused by unlicensed Part 15 users.

Finally, we believe that the deployment of BPL as proposed will endanger homeland security and emergency preparedness, and we propose that, if the Commission proceeds in authorizing BPL, it should relocate the service to microwave bands where it will not cause irreparable harm to the natural resource known as the HF spectrum, the only part of the radio spectrum capable of regularly supporting long-distance communications by natural means.

I. Introduction

1. CQ Communications, Inc. is a publisher of magazines, books, videos and CDs for the personal radio community, including amateur radio operators, shortwave listeners, scanning enthusiasts, and users of CB, Family Radio Service (FRS), Multi Use Radio Service (MURS) and the General Mobile Radio Service (GMRS). This broad and diverse group includes individually-licensed operators, licensed-by-rule operators and unlicensed operators, as well as listeners. We have published several articles on the issues and technology surrounding Broadband over Power Lines (BPL) in all of our magazines, and have posted an information page on our websites, in an effort to educate our readers (and ourselves) on the matter, so that we may comment from a position of knowledge and understanding of the issues involved. We support the concept of greater accessibility to broadband internet service. However, we believe that BPL, especially as currently configured, is the wrong way to accomplish this worthy goal.

2. Our concerns in this matter include the continued ability of personal two-way radio users to conduct communications in the public interest; the continued ability of listeners to receive international broadcasts, monitor so-called “utility” communications and public service communications; and most importantly, the continued ability of those essential radio services using the high frequency (HF) and low VHF ranges – including military, law enforcement and emergency/disaster response agencies – to conduct communications without being subjected to harmful interference.

3. We believe the potential benefits to the public of Broadband over Power Lines (BPL) are overstated, that the damage that will be caused by BPL interference is understated, and that the HF/low VHF range is the wrong portion of the spectrum for BPL to operate. In addition, we feel that certain technical issues have not been discussed sufficiently, if at all, and that the methods proposed in the NPRM for dealing with interference are inadequate and unrealistic. Furthermore, we believe that the FCC’s promotion of BPL is at odds with other Commission policies, and that this NPRM is premature, particularly in light of the conclusion by the National Telecommunications and Information Administration (NTIA) that additional study is required in some of the technical areas we feel need greater discussion. Finally, we believe that one of the greatest dangers posed by

BPL is that once the "genie" is out of the bottle, it will be virtually impossible to put it back in, Part 15 rules notwithstanding.

II. Promise of Universal Broadband Access is Overstated

4. The BPL industry has done an excellent job of promoting its service as, in the words of Commissioner Abernathy, "broadband nirvana." Even the President of the United States is embracing BPL. However, we believe the promise of BPL has been overstated and that policymakers from President Bush on down have been misinformed at best, and deceived at worst.

5. Despite the existing infrastructure of power lines, poles, etc., BPL requires that providers run (generally) fiber-optic cable between the internet access point and the "injector" that places the data signals onto the power lines for the "last mile" to a user's residence or business. In addition, at least one test site (Amperion/Progress Energy) uses wireless networking (WiFi) to bring the signal from the power line into each subscriber's home. Fiber-optic networks and wireless networks are expensive to build and maintain.

6. In rural areas, where potential subscribers are widely separated, the cost of building and maintaining the network to provide BPL service would be prohibitive – the same reason that high-speed internet access is not already available in these areas via phone lines (DSL) or cable TV. If it costs a power company $10,000 to equip for BPL a rural power line that serves four potential customers, and only two sign up at the current "going rate" of approximately $30 per month, it would take the utility nearly 14 years to recoup its initial investment, to say nothing of the added costs of maintenance, internet access and provision of content, e-mail addresses, web servers, etc.

7. In more built-up areas, BPL providers generally would be in competition with already established cable and DSL providers. Since there would be virtually no difference in content and little, if any, noticeable difference in speed, the main point of competition would be price. Most high-speed internet providers today make their profit on volume rather than a high profit margin per customer. Driving down prices in order to "capture" users from other services would likely touch off price wars that, while initially beneficial to consumers, might in the long run result in one or more providers dropping out of the market and remaining providers raising their prices to recover losses suffered during the "price war." The end result is likely to be exactly opposite of what is being promoted – fewer choices at higher prices.

8. Simply put, BPL does not make economic sense to most consumers or most utilities, which could better use their resources to upgrade the power transmission system to assure a steady supply of electricity and prevent recurrences of last summer's massive blackout in the Northeast.

9. Technically speaking, BPL is on shaky ground as well. The technology is quickly becoming obsolete. The recent adoption of IEEE standard 802.16, for metropolitan area networks, provides for secure, wide-area wireless networks. Particularly for those utilities

using 802.11 local area wireless networks for the final link to the consumer, why bother with BPL at all? Why not simply set up a completely wireless 802.16/802.11 network? The existing infrastructure of power poles, etc., can still be used, without the interference concerns surrounding BPL.

III. Damage from BPL Interference to Licensed Services is Understated

10. Proponents of BPL claim either that there is no interference problem or that mitigation techniques can prevent or quickly resolve any problems that do arise. We disagree, and so, apparently, does the NTIA.

11. We agree with the concerns expressed by the American Radio Relay League (ARRL) and the findings of its staff and independent studies, particularly in relation to interference to amateur radio operations. However, our concerns – based on the technical findings of both ARRL and NTIA – extend beyond amateur radio to international broadcasting, CB, radio/control and the many private and government radio services operating in the HF and low VHF segments of the radio spectrum. Amateur radio has a very capable representative in the ARRL; most other personal radio services do not have similar representation in Commission proceedings, such as this one, that may affect their ability to use those services or to monitor broadcasting or public service licensees. We do not claim to represent these individuals, although many of them are our readers, so we are cognizant of their interests; we merely want to remind the Commission that the "universe" of personal radio users and shortwave/VHF listeners extends far beyond the nation's 684,000 licensed amateurs.

12. The NTIA study, released just days before the close of the comment period, confirms that there is significant BPL interference to radio receivers within several hundred (sometimes more than 1000) feet of BPL systems, including the wires carrying BPL signals. The interference is greatest, according to NTIA, for those stations employing high-gain antennas. Most personal radio users in the United States, be they amateur licensees, CBers, users of other two-way service (such as MURS and GMRS), or listeners, live within 1000 feet of a power line, generally much closer. If BPL deployment is to become nationwide, then virtually every personal radio user in the country will be subject to the interference that BPL proponents claim does not exist, but which NTIA and others have found without difficulty.

13. In addition to the types of interference already discussed at length in previous comments, particularly by the ARRL, there are other interference concerns that we will discuss in more detail in the following section. Specifically, these include skywave propagation of BPL signals, radiation of spurious BPL signals on unintended frequencies due to impedance discontinuities, and the discontinuity of FCC standards for BPL and other Part 15 radiators of RF energy.

IV. Certain Technical Issues Have Not Been Adequately Discussed

14. One of the unique properties of the HF spectrum is its ability, under commonly occurring conditions, to propagate even very weak signals over very great distances. One of the most popular activities in amateur radio today is "QRP," or low-power operating, either to see how far you can communicate using very small amounts of output power or the more practical goal of being able to communicate with portable equipment from remote locations such as mountaintops, etc. ("HF-packing" is a popular subset of QRP operating which combines backpacking with HF amateur operating, often in wilderness areas without cell phone coverage.) In addition, serious shortwave listeners will tell you that their greatest challenges involve listening for low-power broadcast or "utility" stations in remote corners of the globe. Every month, the pages of our *Popular Communications* magazine chronicle their successes in their logging reports. In the 1960s and 70s, the Commission found, to its dismay, that 5-watt signals from CB transceivers on 27 MHz were easily capable of communications far beyond the 155-mile limit imposed by Part 95 of the Commission's rules, and that hundreds of thousands of CBers were simply unable to resist the temptation of "working skip" despite it being a violation of the rules. There is no question that weak signals transmitted on HF frequencies – even *very* weak signals – can travel hundreds or thousands of miles.

15. This ability to cover great distances on HF is due to the phenomenon of *skywave* propagation, in which signals reaching various layers of the ionosphere are bent and returned to Earth (refracted) very far from their point of origin. BPL signals, even though they will be very low-power signals, will not be immune to the effects of skywave propagation. This creates the possibility, particularly considering the aggregation of hundreds or thousands of these signals, of large-scale interference at points hundreds or thousands of miles removed from the source(s). The net effect, most likely, will be to simply increase the noise floor, making it impossible to pull out any one signal sufficiently to identify it or its source. Increasing the noise floor will make it difficult or impossible for airliners beyond the range of domestic VHF communications to make contact with controllers, for weak distress signals from boats at sea to be received, or for "HFPack"ing amateurs to communicate from the wilderness. Simply put, widespread deployment of BPL will compromise the ability of any station (even outside a BPL area) to successfully receive any weak HF signal.

16. The issues of skywave propagation of BPL signals and of the cumulative effect of the aggregation of multiple BPL signals have not been addressed by any previous comments that we have seen in this matter, nor in either the original NOI or this NPRM. The NTIA, in its report on its comprehensive analysis of BPL interference potential, identified ionospheric propagation and aggregation as matters that required further study and that would be included in Phase 2 of its study. We look forward to the NTIA's objective analysis of these issues and urge the Commission to take no action on enacting BPL rules until the NTIA study is complete and its report on Phase 2 is delivered to the Commission.

17. Another major issue identified by the NTIA is that of unintended radiation due to impedance discontinuities, but NTIA focused on only one aspect of that problem. In addition to radiation from points on a power line remote from the BPL unit itself, which

the NTIA covered in great detail, these discontinuities may also result in radiation on unintended frequencies. The technology for generation of radio signals produces not only signals on the intended frequency/frequencies of operation, but also "harmonic" signals on multiples of the intended frequency/frequencies. FCC rules for certification of transmitting equipment place stringent requirements on designers and builders to significantly attenuate these harmonic signals before they leave the transmitter (one of the primary reasons for the harmonic relationship of the original post World War II amateur bands at 1.8, 3.5, 7, 14, 28 and 56 MHz, was so that any spurious harmonics that were unintentionally transmitted would fall only in other amateur bands and not cause interference to other services). The Commission's own Enforcement Bureau is well aware of the significant ongoing problem with interference to licensed users as a result of these impedance discontinuities caused only by power transmission, without RF signals being introduced intentionally onto power lines. Yet there are no requirements proposed for attenuating harmonic radiation resulting from impedance discontinuities on power lines and their associated equipment.

18. A related problem is that of *intermodulation*, or the modulation of one signal by another, usually due to the same impedance discontinuities, also known as non-linearity. In this case, the BPL signals can mix with signals from a nearby transmitter to produce new signals on the sum and difference frequencies. For example, if a BPL signal at 27 MHz were to mix at a non-linear junction point with a signal from a nearby amateur transmitter at 147 MHz, two new signals would be produced – at 174 MHz in the public safety band and at 120 MHz in the aircraft band. Thus, the BPL signal would not only be causing interference to CB communications at 27 MHz but also potentially to aircraft and public safety communications. This is an issue that has not yet been discussed but which must be considered, as the effects may be far-reaching, causing interference to services far removed in frequency from proposed BPL operating frequencies.

19. In addition, there is a discontinuity in the Commission's rules for other devices emitting RF radiation and its proposed rules for BPL. Like the radio transmitters referenced above, all sorts of electronic devices, from computer monitors to CD players and personal digital assistants, must have FCC certification as to meeting standards for attenuation of unintentional RF radiation. Laptop computers, CD players, and PDAs may not be used aboard airplanes during takeoff and landing due to concerns about their potential for interfering with the aircraft's navigation and communication systems. The amount of RF energy emitted by these devices is minuscule, yet it is recognized that they have the potential to cause interference and thus endanger the aircraft and the lives of its passengers and crew. Yet the frequencies planned for use by BPL systems include the 74.8-75.2 MHz band on which aircraft navigation beacons transmit! And the NTIA concluded that the greatest radiation from BPL equipment and associated power lines is *upward*! The NTIA measured interference to aircraft at frequencies between 4 and 40 MHz, and found significant interference potential. Imagine what could result if a BPL system along a jet airway (they criss-cross the country) operates at 75 MHz! It makes no sense whatsoever to say that a laptop computer poses a hazard to an aircraft's navigation systems and at the same time say that blanketing the beacon band with signals of greater strength than any laptop produces does not pose a hazard. The Commission must be

consistent, and it must put public safety ahead of utility profits or even of broadband internet access.

20. Listening to BPL signals is reminiscent of what amateurs called the "Russian Woodpecker" back in the early 1980s. This was a very strong signal (which turned out to be Soviet over-the-horizon radar) that rolled through the HF spectrum, making whatever portion it was "visiting" unusable until it moved on to the next set of frequencies. While BPL signals do not share the "woodpecker's" other characteristics, such as very high power and originating from one source, the effect is even greater. Not only does BPL produce very strong signals on nearby receivers, but those signals never go away. They are on constantly, 24 hours a day, 7 days a week, 52 weeks a year. The only time those signals will move is in response to either a strong nearby transmitter or (possibly) complaints of interference. Even then, the signals will merely shift to cover up another group of frequencies. Any amateur or shortwave listener living in reasonably close proximity to a BPL system will permanently lose access to one or more bands.

21. Yet another technical matter that has not been discussed, let alone explored, is whether BPL signals cumulatively are in compliance with the Commission's standards for human exposure to RF radiation or whether those standards, designed for point source radiators, are applicable in this case. ARRL compares power lines energized with BPL signals to giant antennas, and NTIA confirms that a BPL device and its associated power lines are indeed multi source radiators. The net result is that people living in close proximity to BPL-energized power lines, or walking along sidewalks beneath those lines, are subjected to a never-ending stream of low-level RF radiation. In the case of a whole town wired for BPL, this would be the entire population of that town. We don't know the cumulative effects of constant exposure to low-level RF radiation. After all, even a person living close to a broadcast station occasionally leaves home. If an entire town was hooked up to BPL, there'd be no escape. The jury is still out on whether RF exposure actually causes any health risks, but since we don't really know if there is a danger, the Commission has taken a very cautious and reasonable path of restricting public exposure to RF fields. The Commission must take the same approach with regard to public exposure to RF fields generated by BPL signals, and until more is known about the effects of long-term constant exposure to low-level RF, must take reasonable precautions to protect the public from any potential danger.

V. Proposed Methods for Dealing with Interference are Inadequate

22. We are in full agreement with NTIA's conclusion that current measurement techniques and equipment are insufficient for use in determining levels of RF noise produced by BPL operation, and we applaud their comprehensive recommendations for interference prevention and mitigation techniques. However, the NTIA itself admits that many of its recommended approaches will be of limited effectiveness and may occasionally not work at all. In addition, virtually all of the interference mitigation techniques proposed focus on radio services which employ a limited number of discrete frequencies in a specific area. These techniques are insufficient for mitigating interference to frequency agile radio users, including the military, FEMA, amateurs and

shortwave listeners. Furthermore, very little consideration is given to the fact that BPL signals will be "always on," blanketing all frequencies within a given 6-MHz swath 24 hours a day, seven days a week.

23. In Section 8 of its comprehensive report, the NTIA makes nine specific recommendations regarding interference prevention and mitigation techniques, some of which are in the NPRM and others of which are new. We agree with NITA's statement that "(t)he single most effective method for reducing the potential for harmful interference from a BPL device may be to reduce the RF power it generates." Amateurs have long operated under a similar requirement to use the minimum amount of power necessary to establish and maintain contact. However, even power reduction will not suffice when the power lines carrying BPL signals are in close proximity to receiving antennas (especially gain antennas that are often necessary for effective HF operation).

24. NTIA next recommends avoidance of locally-used frequencies, either by notching or by *adaptive filtering*, in which the system automatically shifts frequencies to avoid interference *from* strong nearby signals. While notching could theoretically be effective, in practice it would not be. First of all, with licensed services occupying virtually all of the HF and low VHF frequencies slated for BPL use, and particularly in light of the potential for skywave propagation of signals over great distances, it would be virtually impossible to notch out all frequencies on which interference results. That would leave, as someone recently put it, "all hole and no doughnut." In addition, notching is effective only for fixed frequency operations. Public safety agencies, for example, typically operate on one to four specific channels, which could be notched out in a given community. However, in the event of a large-scale emergency involving agencies from other communities, BPL interference could make critical communications impossible. Furthermore, some users, such as the military, FEMA and amateurs, are frequency-agile, sometimes operating briefly on different frequencies within a given band, then shifting to another band elsewhere in the spectrum in response to changing conditions. (It is this frequency agility, and the ability to adapt to changing conditions by changing bands, that makes amateur radio so important in disaster and emergency response.) One of our columnists who worked closely with engineers for Amperion and Progress Energy in the Raleigh, NC BPL tests, calculated that there are only three 6-MHz wide frequency segments in the entire HF spectrum that do not include at least one amateur band. Plus, he was told that a frequency segment, once used, may not be re-used, for at least one half mile in each direction. Therefore, it is impossible to notch out all amateur bands, for example, and still have a viable BPL network. And that doesn't take into account additional notching for aeronautical, land mobile, public safety, etc. Notching is not a realistic approach to interference prevention or mitigation for BPL systems using HF and low VHF spectrum.

25. Adaptive filtering could possibly be more effective, as it could "follow" a frequency-agile user moving from band to band. However, adaptive filtering responds only to a strong transmitted signal, and on the amateur bands, it is long-standing "good amateur practice" to listen before transmitting in an effort to prevent interference. If the only way to find out if a band is "open" for contacts to a desired area is by transmitting with a

strong signal, the risk is increased that the transmitting station will unintentionally interfere with another, far away, station on the same frequency that could not be heard before the BPL signal "moved away." In addition, as NTIA points out, adaptive filtering would only be effective for communications using simplex mode and originating from a local transmitter. There is "significant concern," wrote NTIA, "that such a system, even if it were to work instantaneously, would not reduce the interference potential to systems operating in duplex mode or local weak-signal reception. Interference to these operations may be discovered at the same time effective radio communications are needed most." We share the NTIA's significant concern.

26. NTIA's next recommendation is for *differential mode signal injection*, using the same principles by which unshielded twin-lead may be used as transmission line without radiating itself. This method has potential, but NTIA immediately qualifies its support for this method, based on the realities of the electric transmission network. "It should be noted, however," writes NTIA, "that inherently unbalanced systems such as power lines (due to multiple grounds and transformer taps) will not act as true balanced transmission lines regardless of the method of signal injection. Thus, this method of interference mitigation is limited in impact by the power line configuration."

27. The NTIA also recommends filters and signal terminators, with which we agree, and introduces yet another issue which has not yet been discussed, "in-house interference to radio reception from BPL signal leakage." TV channels 2, 3, and 4, and the lower portion of channel 5, are included in the proposed BPL frequency range and people who don't have cable TV (remember – the primary appeal of BPL is supposed to be for people in rural areas without cable TV), signal leakage could render those channels unviewable. While the nation's TV broadcasters will eventually be shifting to new frequencies for digital TV, the changeover will take several years at best. In addition, some baby monitors, older cordless phones, 27 and 49 MHz walkie-talkies and 72 MHz radio/control devices are subject to direct interference from BPL signals. In addition, due to frequency addition and subtraction issues discussed previously, in-house BPL interference could also affect AM and FM broadcast radio and higher VHF TV channels.

28. The remainder of NTIA's recommendations each have the potential to help somewhat, but none is likely to be 100% effective 100% of the time. Even NTIA is uncertain as to the effectiveness of the methods it recommends, and is planning to test and report on their efficacy in Phase 2 of its study. The Commission would be well-advised to wait for those study results before making decisions.

VI. Interference Mitigation is the Sole Responsibility of the Non-Licensed User

29. The Commission suggests in the NPRM that interference mitigation is partially the responsibility of the licensed operator. In paragraph 35, acknowledging that power lines *without* BPL are already a significant source of interference to amateur radio operations, the Commission states that "(w)e therefore would expect that, in practice many amateurs already orient their antennas to minimize the reception of emissions from nearby electric

power lines." This is ludicrous for several reasons. First of all, Part 15 is very clear that in the event of interference between a licensed user and a non-licensed user on a given frequency, the responsibility for resolving the interference lies *entirely* with the non-licensed user, even so far as terminating operations if the problem cannot be resolved. Suggesting that licensed users bear partial responsibility for mitigating interference from non-licensed users flies in the face of the intent of Part 15 and decades of successful sharing under Part 15.

30. In its statement above, the Commission is essentially admitting that it cannot properly enforce the provisions of Part 15 relating to unintentional radiation from power lines (we regularly see repeat letters from the Enforcement Bureau to power companies that have either ignored previous communications or have taken insufficient action to resolve the interference), yet it proposes to permit these same power companies to intentionally introduce RF signals to these same noisy lines and says, "don't worry, our rules say the companies can't interfere with you." They are interfering with us now, rules or no rules; many are not responding to requests or even demands by the Enforcement Bureau to resolve interference complaints. So how should one expect that they will respond any differently to BPL complaints?

31. If anything, the reluctance of power companies to deal with existing interference problems is a strong argument for prohibiting BPL. And if turning an antenna away from the noise source was an effective means of dealing with power-line RFI, then why is it necessary for the Enforcement Bureau to send out an average of two-to-three letters per month to power companies, seeking (sometimes demanding) cooperation from the utility in resolving long-standing interference problems?

32. Finally, not all amateurs, shortwave listeners, CBers, etc., have the luxury of being able to use directional antennas that may be oriented to minimize interference from nearby power lines. The writer of these comments, for example, has only an omnidirectional vertical antenna for HF operating. It cannot be turned away from anything.

VII. Mixed Results from BPL Deployments in Other Countries

33. One reason given by the Commission for encouraging BPL is that (Paragraph 30) "Access BPL is being developed worldwide, and encouraging the deployment of the technology in the United States will support globalization of products and services (and) promote continued U.S. leadership in broadband technology…" However, our news coverage of this issue, confirmed by the NTIA report, shows that results have been noticeably mixed with BPL in other countries. For example, NTIA reports (Appendix B) that in Austria, communication was "massively disturbed" by BPL during a Red Cross emergency exercise, "with interference levels exceeding the limits by a factor of 10,000." NTIA also reports that several large companies in Europe (e.g., Siemens in Germany, NUON in the Netherlands) have gotten out of the BPL business. We also understand that Japan has declined to authorize BPL deployment because of interference problems.

34. The United States government recently has been of the belief that it must do what it sees as "the right thing," regardless of whether other countries share our point of view. Sometimes, world leadership requires "going it alone" and not necessarily following the lead of other countries. To suggest that the US should promote BPL because other countries are doing it flies in the face of this philosophy. The United States should do what is right, regardless of what other countries are doing (and in this case, there is no consensus among other countries). What is right in this case is to put public safety first, by protecting critical radio communications services from interference. At the very least, what is right at this point is to wait for NTIA to complete its study and issue its Phase 2 report, and take into consideration other independent studies as well as the comments received on this NPRM.

VIII. BPL Will Endanger, Not Enhance, Homeland Security and Emergency Preparedness

35. In paragraph 13 and 30 of the NPRM, the Commission suggests that widespread deployment of Access BPL will help bolster homeland security by enhancing the ability of utilities to protect the protect the electric power distribution system. Considering the utilities' inability as recently as the summer of 2003 to protect the system from collapsing onto itself, perhaps their resources would be better spent investing in upgrading and improving the infrastructure itself, to concentrate, as ARRL President Jim Haynie has said, on "PPL – Power over Power Lines," rather than BPL.

36. Indeed, BPL will endanger homeland security, not enhance it. One BPL proponent's response to early concerns by the Federal Emergency Management Agency (FEMA) was that, if a disaster occurred that required FEMA to respond, the power would probably be out so BPL wouldn't be a problem. When the attacks of 9/11 occurred, power in New York City was out only in the immediate area surrounding "Ground Zero." Had BPL been up and running in New York City on 9/11, it would have kept running, and it would have hindered early response to the disaster, as thousands of emergency personnel from dozens of jurisdictions headed to New York to help, all using different radio frequencies. BPL interference would have made it that much more difficult to communicate in a moment of extreme need. In addition, applying the concerns voiced above about skywave propagation of BPL signals, it is possible that interference originating hundreds of miles from a disaster area could still disrupt emergency communications into and out of that disaster area – generally conducted with low power on HF bands.

37. In addition, the ability of citizens to monitor suspicious radio communications and report it to the authorities will be hindered by BPL interference, further endangering homeland security by depriving officials of tens of thousands of extra "ears" listening for clues to planned attacks. The electric power industry should be able to find a way to protect its vital infrastructure without destroying the ability of government officials and volunteers alike to communicate in the event of an emergency or disaster.

IX. Conclusion

38. Once the BPL "genie" is out of the bottle, it will be virtually impossible to stuff it back in. When interference proves to be as great a problem as the ARRL, the NTIA and others have determined it will be, even though licensed users will have the right to demand that the BPL system be shut down, the reality is that people will not understand why they are being deprived of their internet access and it will be very difficult politically for either licensed users or the FCC to shut down a system once it is in full operation. We believe the BPL industry is counting on this "fact of life" and that the Commission is already aware that its Part 15 rules will be unenforceable – despite statements to the contrary in this NPRM – as evidenced by its suggestion in the first paragraph of the Discussion section that licensed operators bear at least partial responsibility for interference mitigation. This is unacceptable.

39. We remain mystified as to the appeal of the 2-80 MHz segment of the RF spectrum for BPL operation. We have not seen anywhere why these frequencies are technically superior to other possibilities. All we know is that these frequencies are the only ones in the entire electromagnetic spectrum capable of regularly supporting long-distance radio communication via natural means, and that this portion of spectrum is a precious natural resource that must not be polluted with signals that can function just as well elsewhere without causing so much permanent harm. An 80-MHz wide piece of spectrum in the upper UHF and microwave bands will offer the same bandwidth to BPL providers with none of the concerns about ionospheric propagation or interfering with a long-established base of existing users. Wireless networks are already sharing spectrum successfully with other services (including amateurs) on frequencies above 2 GHz. At these frequencies, a frequency segment 80 MHz wide is considered small. Yet in the HF range, it occupies the entire HF spectrum and part of the low VHF spectrum. This is the poorest possible choice of spectrum, from the perspective of its many and varied current users.

40. We propose relocating the BPL service to frequencies above 2 GHz, where it may coexist much more peaceably with its (far fewer) neighbors and operate without most of the interference concerns that go along with being in the HF and low VHF spectrum.

41. Finally, we urge the Commission to make no decisions before giving the NTIA ample opportunity to complete its interference study and issue its Phase 2 report. Considering the interference problems already identified in the NTIA Phase 1 report, we believe the Commission should and will conclude that the public interest is best served by relocating the BPL service to frequencies above 2 GHz.

Respectfully submitted,

CQ Communications Inc.
25 Newbridge Rd.
Hicksville, New York 11801

By: Richard S. Moseson, Editorial Director